

Your ref: PCT/SG2004/000411
 Our ref: MATR/20402292/JW/cp
 Date : 22 April 2005

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Attention: Ms Maki Mary Anovich

Dear Sirs

MATRIXVIEW LIMITED
PCT PATENT APPLICATION NO. PCT/SG2004/000411
"COMPRESSING IMAGE DATA"

We refer to the International Search Report and Written Opinion of the International Searching Authority dated 10 February 2005.

The examiner asserts that claims 1, 3, 5, 12, 13, 20 to 22, 26, 27, 30, 32, 33, 36 and 52 are not novel when compared to various cited documents. Also, the examiner asserts that all claims are not inventive when compared to various cited documents.

We respectfully submit that the examiner has not fully appreciated or understood the present invention. The present invention is not a data compression system in and of itself. In fact, it is a technology to increase compressibility of data. That is, the present invention is performed at the stage of pre-processing in order to prepare/transform the data for compression by, for example, Huffman encoding or run length (RL) encoding. The bit plane is an important feature as it is constructed to remember how the data was transformed, the order and location of the original data. In one embodiment, the bit plane is only 1 bit in size, which reduces overheads and ensures that a high level of compression is achieved. The present invention may be used iteratively with multiple levels of bit planes. That is, the output of the present invention is passed to Huffman encoders or RL encoders.

The present invention teaches away from the cited documents. The concept of the present invention is the consideration of the sequence and arrangement of the original data. That is, the present invention takes into consideration the inter-pixel correlation of image data. Huffman encoding does not factor this in. This is one reason why Huffman encoding is different from the present invention.

RL encoding suffers where a data sequence contains intervening data elements which are not identical to adjacent data elements. Since a digital image includes some random image data, RL encoding does not produce a desirable compression ratio. RL encoding does not "transform the image data into a bit plane of first and second values". An illustrative example is provided for the examiner's convenience differentiating the present invention from RL encoding:

Example data sequence:

| | | | | | | | |
|----|----|---|----|-----|----|----|--------------|
| 10 | 10 | 9 | 10 | ... | 11 | 10 | (20 symbols) |
|----|----|---|----|-----|----|----|--------------|

Run length encoding to expand the number and occurrence:

| | | | | | | | | | |
|----|---|---|---|----|----|----|---|----|---|
| 10 | 2 | 9 | 1 | 10 | 13 | 11 | 1 | 10 | 1 |
|----|---|---|---|----|----|----|---|----|---|

In contrast, the example data sequence using the present invention provides:

Repetition Coded Compression to expand the number and occurrence:

| | | | | | | |
|----|---|----|----|----|---|-----------|
| 10 | 9 | 10 | 11 | 10 | + | Bit Plane |
|----|---|----|----|----|---|-----------|

We submit that US 2002/0084921 does not disclose "comparing each image element with a previous image element and if they are equal, recording a first value into a bit plane; and if they are not equal, recording a second value into the bit plane" as defined by claim 1. US 2002/0084921 merely discloses determining the maximum number of significant bit planes of the whole code block and storing this in a first word of a header. It is clear that US 2002/0084921 does not teach or suggest element by element comparison as required by the present invention. Following on, the feature of "encoding repeating first and second values in the bit plane into a bit plane index" as defined in claim 1 of the present invention is not taught or suggested by US 2002/0084921.

Similarly, US 6,351,568 does not disclose "comparing each image element with a previous image element and if they are equal, recording a first value into a bit plane; and if they are not equal, recording a second value into the bit plane" as defined by claim 1.

US 6,263,109 discloses storing coefficients in three bit planes. US 6,263,109 is directed towards estimates of probabilities. Therefore it is not a lossless system. US 6,263,109 does not disclose "comparing each image element with a previous image element and if they are equal, recording a first value into a bit plane; and if they are not equal, recording a second value into the bit plane" as defined by claim 1.

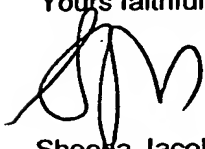
WO 1998/037700 discloses bit planes for coefficient blocks. WO 1998/037700 does not disclose "comparing each image element with a previous image element and if they are equal, recording a first value into a bit plane; and if they are not equal, recording a second value into the bit plane" as defined by claim 1.

Although the cited documents refer to a "bit plane", this not equivalent to the bit plane of the present invention since the function and what is stored in the bit plane are completely different. The bit planes of the prior art store pixel values, whereas the bit plane of the present invention is not an indication of pixel value. This clearly teaches away from the prior art. Furthermore none of the cited documents disclose a "bit plane index".

Therefore, we respectfully submit that the examiner's objections are traversed.

We look forward to receiving a clear Written Opinion in due course.

Yours faithfully



Sheena Jacob
Partner

ALBAN TAY MAHTANI & DE SILVA